

<b>Brookhaven National Laboratory</b> <b>National Synchrotron Light Source</b>		<b>Number:</b> LS-PPS-0020	<b>Revision:</b> B
		<b>Effective:</b> 05/9/02	<b>Page 1 of 5</b>
<b>Subject: <u>X-5A Target Area Radiological Interlock Test</u></b>			
<b>Prepared/</b> M. Buckley <b>Approved By:</b>		<b>Approved By:</b> S. Buda	

\*Approval signature on file with master copy.

Test Date:	Test Result: <input type="checkbox"/> Passed <input type="checkbox"/> Failed
Test Reason:	Test Type: <input type="checkbox"/> Full <input type="checkbox"/> Partial
	Start Time: Finish Time:
Tester 1:	Assistant 1:
Tester 2:	Assistant 2:

### PREPARATION:

[Revision/Periodic Review Log](#)

Inform control room operator that test will be done.

LOTO lockout switch on x-ray ring interlock.

Request X5 personnel install beam pipe across walkway to satisfy user interlock.

Verify that vacuum valves and water interlocks are satisfied on the beam line.

Obtain spare Kirk key #16346 for use in rollup door lock in step 13.

Secure laser hutch.

#### 1. Search the Target Area

The red rotating beacon comes on

The audible alarm sounds for 13-15 seconds minimum

#### 2. Open hutch door

The hutch interlock sign goes out

#### 3. Press second check station (CS-2)

Pilot light does not stay on

Exit hutch, close door, press CS-E.

Interlock does not activate

Press CS-1, and CS-E.

Interlock does not activate

#### 4. Wait for rotating beacon to stop. Press CS-1, CS-2. Close Target Area door and wait.

Rotating beacon stops not more than 2 min after starting.

Press CS-E.

Interlock does not activate

#### 5. Press interior search buttons in order, close door, press CS-E, note that alarm comes on, open and close door, press CS-E again. (This must all be done in less than the timeout internal noted in step 4)

Interlock does not activate

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6. Search target area; one person remains inside.

The Safety Shutter "enable" light does not come on until the end of the warning interval \_\_\_\_\_

7. The person inside presses Emergency Stop #1 Button.

The shutter "enable" light goes out \_\_\_\_\_

The ES indicator comes on \_\_\_\_\_

The ES latch cannot be reset unless the SOR key is turned \_\_\_\_\_

8. Press and reset the other four Emergency Stop buttons testing one at a time..

The ES indicator comes on

The ES latch cannot be reset unless the SOR key is turned

ES#2

ES#3

ES#4

ES#5  
(Loft)

9. Place latch device on Fan Loft door lock so key can be removed.

Place switch holders on door switches. Search Fan Loft and target area, put door key in SRU, open safety shutter.

Remove holder from switch 2.

RIB latch light comes on \_\_\_\_\_

Replace holder on switch 2.

RIB cannot be reset unless SOR key is turned. \_\_\_\_\_

Remove holder on switch 1.

Safety shutter closes \_\_\_\_\_

RIA latch light comes on \_\_\_\_\_

Target area interlock drops \_\_\_\_\_

Red "door" light on shutter control panel comes on \_\_\_\_\_

RIA cannot be reset w/o SOR \_\_\_\_\_

Replace holder on switch 1.

Red door light remains on \_\_\_\_\_

Search Fan Loft.

Red door light goes out only after completing search \_\_\_\_\_

"Upstairs secure" light is on \_\_\_\_\_

10. Remove holders from the switches and latch device on the Loft Door. Stand inside the loft area and open and close the door.

Both door switches operate freely and each makes a "click" when door is opened. \_\_\_\_\_

Search Loft area.

FAN  
LOFT  
DOOR



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16. Search Target Area and leave shutter closed.

Beam line transfer key can be removed only if button on SRU is pushed

Open safety shutter.

Beam line transfer key can't be removed even if button is pushed

Close safety shutter. "Cheat" KKBL SRU so key can be removed.

Open safety shutter, remove key, and replace.

RIA latch light comes on

RIB latch light comes on

The safety shutter closes

SPA comes on

SPA cannot be reset w/o SOR

Reset RIA and RIB.

17. Open safety shutter and press an emergency stop button.

RIA latch light comes on

RIB latch light comes on

Area interlock drops out

Reset RIA, RIB, and ES.

18. Search Target Area. Open Shutter. Disconnect cable connector from upstream end of beam pipe across aisle.

RIA latch comes on

RIB latch comes on

The safety shutter closes

Reset RIA and RIB. Open shutter. Disconnect cable at downstream end of pipe.

RIA latch comes on

RIB latch comes on

The safety shutter closes

Replace cable connector.

19. Open the safety shutter.

Remove the Control Room Shutter Enable Key for X-5A, and then replace the key.

The safety shutter closes

RIA latch light comes on

The "Control Room Disable light goes on

The SPA latch comes ON (After the key is turned back to enable)

The shutter cannot be opened

Reset RIA and SPA

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20. Turn "Auto Open" key to "ON". Open safety shutter.

At the Control Room Operator's Console, switch the shutter master enable switch to "Inhibit" and back to "Enable".

The safety shutter closes

And then re-opens

Turn "Auto Open" to "OFF". Cycle shutter master enable again.

The safety shutter closes

And does not re-open

21. One person goes to the x-ray equipment area and resets the indicators for RIAX and RIBX at SR100.

Open the safety shutter.

Remove switch holder from door switch number 2.

RIB latch light comes on

RIBX "Loop Enabled" indicator goes out

RIBX "Loop Disabled" indicator comes on

Replace switch holder.

RIBX cannot be reset

Reset RIB

RIBX CAN be reset

("Loop Enabled" indicator comes on)

22. Remove holder from door switch 1.

RIA latch light comes on

RIAX "Loop Enabled" indicator goes out

RIAX "Loop Disabled" indicator comes on

The safety shutter closes

RIAX cannot be reset

Reset RIA.

RIAX CAN be reset

("Loop Enabled" indicator comes on)

23. Remove the holders from switches on Door 'A'. Remove the latch device from the door lock. Stand inside the Target Area and open and close the door.

Both door switches operate freely and each makes a "click"

when door is opened

24. Search the Target Area. One person goes into the x-ray tunnel and locates the safety shutter associated with X-5A by tracing the beam pipe through the shield wall. Do not rely on labels on the shutter mechanism. Open and close the shutter several times.

The correct shutter opens

No other shutter at that sawtooth attempts to open

The mechanism moves freely and without hesitation

25. Return the spare Kirk key #16346 to the spares cabinet

26. Remove interlock test jumper and replace interlock cable (if applicable).

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